

A Review of the New Zealand Recent Species of *Poirieria* Jousseau, 1880 (Mollusca: Gastropoda: Muricidae) with Description of a New Species

Bruce A. Marshall

Museum of New Zealand Te Papa
Tongarewa
P.O. Box 467
Wellington, New Zealand

Roland Houart

Research Associate
Institut Royal des Sciences Naturelles
de Belgique
Vautierstraat 29
B-1040 Brussels, Belgium

ABSTRACT

Poirieria syrinx n. sp. is described and compared with *P. zelandica* (Quoy & Gaimard, 1833) and *P. kopua* Dell, 1956. *Poirieria syrinx* is recorded from Early Pleistocene beds at Palliser Bay, and living at 482–786 m off the east coast of the North Island. It is locally sympatric with *P. zelandica*, which is widely distributed off New Zealand at 0–540 m depth. Challenger Expedition specimens of *P. zelandica* reputedly from Tongatabu and the Kermadec Islands are considered to have been translocated from Queen Charlotte Sound, New Zealand. *Poirieria kopua* occurs at 490–1006 m off the east coast of the South Island. Some groups with similar species are commented upon, including *Pagodula* Monterosato, 1884 and *Enixotrophon* Iredale, 1929. The type species of *Enixotrophon* (*Trophon carduelis* Watson, 1883) is newly recorded from New Zealand, and its radula is illustrated for the first time.

Key words: Mollusca, Gastropoda, Muricidae, *Poirieria*, new species.

INTRODUCTION

The present contribution was initiated when we recognized an undescribed species of *Poirieria* from the continental slope of the North Island of New Zealand. The new species differs markedly from the well known species *P. zelandica* (Quoy & Gaimard, 1833) and the rare *P. kopua* Dell, 1956 in having tubular shell spines.

ACRONYMS

AMS The Australian Museum, Sydney
BMNH The Natural History Museum, London
MNHN Muséum National d'Histoire Naturelle, Paris
MNZ Museum of New Zealand, Wellington
NZGS Institute of Geological and Nuclear Sciences, Lower Hutt

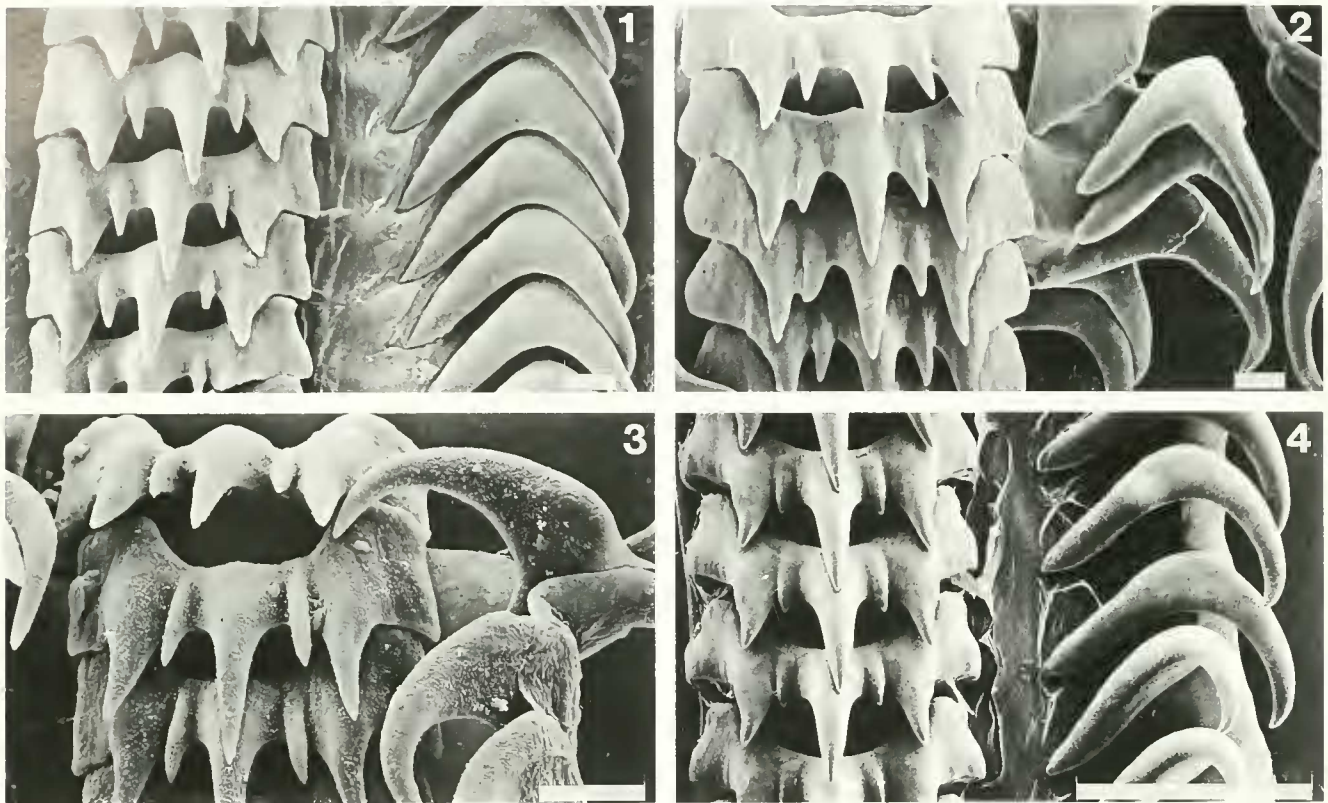
NZOI National Institute of Water and Atmospheric Research, Wellington

SYSTEMATICS

Order Neogastropoda Thiele, 1929
Superfamily Muricoidea Rafinesque, 1815
Family Muricidae Rafinesque, 1815
Subfamily Muricinae Rafinesque, 1815
Genus *Poirieria* Jousseau, 1880

Poirieria Jousseau, 1880:335. Type species (by original designation): *Murex zelandicus* Quoy & Gaimard, 1833; Pliocene-Recent, New Zealand.

Remarks: The radula of *Poirieria* species is morphologically very similar to those of the Recent European muricine *Trophon echinatus* (Kiener, 1840) (Bouchet & Warén, 1985, fig. 333) and a number of bathyal Indo-West Pacific species (mostly undescribed—AMS, MNHN, MNZ), among them *Trophon carduelis* Watson, 1883 (Watson, 1886, pl. 10, fig. 7), the type species of *Enixotrophon* Iredale, 1929 (type locality New South Wales: here newly recorded from off the North Island and the west coast of the South Island, New Zealand, living at 676–1217 m—MNZ, NZOI) (figures 1–4). Some of these have even longer shoulder spines than most *Poirieria* species, though all differ in having the shoulder spines set closer to the rim of each varix, and radular teeth that are larger in shells of comparable size. Neither *Poirieria* species nor *Trophon echinatus* or *T. carduelis* appear to be closely related to *Trophon* Montfort, 1810 (type species *Buccinum geversianum* Pallas, 1774; Recent, southern South America) or to *Boreotrophon* Fischer, 1884 (type species *Murex clathratus* Linnaeus, 1758; Recent, northeastern Atlantic), both of which differ in details of central radular tooth morphology (Harasewych, 1984; personal observation). *Trophon echinatus* is closely similar to *Murex vaginatus* De Cristofori and Jan, 1832



Figures 1–4. Radulae of New Zealand *Poirieria* and *Pagodula* species. 1. *Poirieria zelandica* (Quoy & Gaimard, 1833), subadult, off Matakaoa Point, Hicks Bay, 99–102 m, MNZ M.60498, shell height 30.0 mm. 2. *Poirieria syrinx* new species, holotype (adult). 3. *Poirieria kopua* Dell, 1956, adult paratype, Chatham Rise, 530 m, MNZ M.10506, shell height 14.7 mm. 4. *Pagodula carduelis* (Watson, 1883), adult, off Gisborne, 913–750 m, NZOI sta. E719, shell height 50.5 mm. Scale bars 1–3 = 100 μ m, 4 = 1.0 mm.

(Pliocene, Italy), which is generally interpreted as the type species of *Pagodula* Monterosato, 1884 (Bouchet & Warén, 1985:126). It seems plausible, therefore, that *Pagodula* is the most appropriate genus group name for *T. carduelis*, and thus by implication that *Enixotrophon* is a junior synonym.

The type species of *Paziella* Jousseaume, 1880 (*Murex pazi* Crosse, 1869; Recent, Caribbean), and especially *Actinotrophon* Dall, 1902 (*Trophon actinophorus* Dall, 1889; Recent, Caribbean) (see Bayer, 1971, figs. 30, 35D) are so similar to New Zealand Recent *Poirieria* species in shell and radular morphology that separation on these characters alone seems untenable. Harasewych (1984) and Kool (1993a, b), however, have shown that shell characters (unlike anatomy) in Muricidae are subject to convergence, while Kool (1987) concluded that radular characters are largely unrelated to food-type and are thus a useful clue to phylogenetic relationships. We follow Vokes (1970, 1992) in treating *Paziella* and *Actinotrophon* as subgenera of *Poirieria*.

Incidentally, although *Paziella* was introduced one line before *Poirieria* (Jousseaume, 1880:335), *Poirieria* has consistently been treated as the senior synonym (e.g. Vokes, 1970, 1992) following Cossmann (1903), who was the first reviser according to ICZN Article 24.

Poirieria zelandica (Quoy & Gaimard, 1833)
(Figures 1, 5, 7, 10–15)

Murex zelandicus Quoy & Gaimard, 1833: 529, pl. 36, fig. 5–7.

Poirieria zelandica. Maxwell, 1971:767 (earlier synonymy); Powell, 1979: 170, pl. 35, fig. 2; Beu & Maxwell, 1990: 358, pl. 48K.

Type material: Holotype MNHN: Cook Strait.

Other material examined: About 100 Late Pliocene and Pleistocene specimens (MNZ, NZGS), and about 1500 Recent specimens in 200 lots (MNZ).

Distribution: (figure 5) Early Pliocene (Opoitian) to Recent. Three Kings Islands southward to Stewart Island, Challenger Plateau and Chatham Islands, New Zealand, living at 0–540 m.

Remarks: This well known species is common throughout most of its range at 20–150 m depth. Small (immature) living specimens occur rarely at considerably greater depths, particularly in the Bay of Plenty (deepest record 490–540 m). One of us (B.A.M.) has taken lightly abraded short-spined specimens on numerous occasions alive from sand at low tide at the eastern end of Ohope

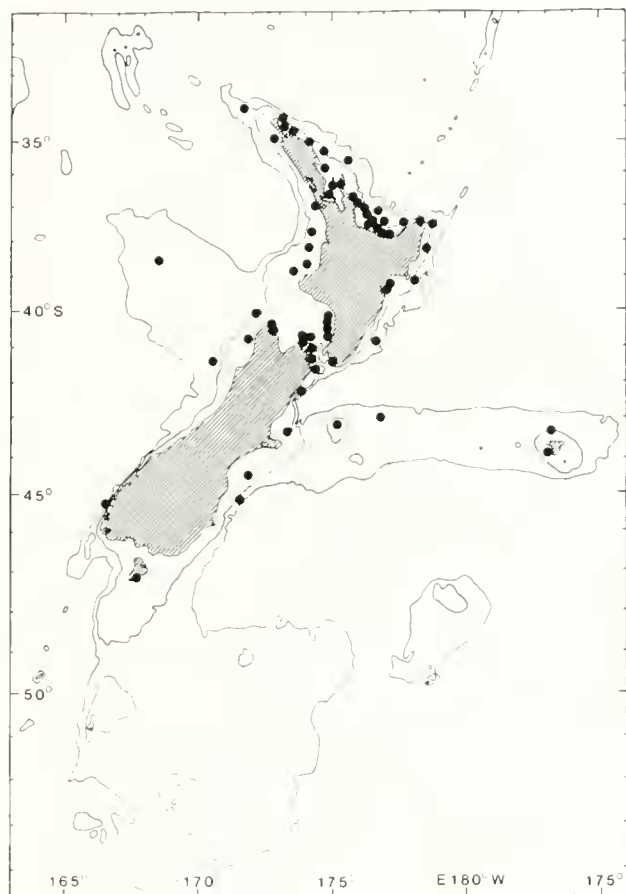


Figure 5. Map of New Zealand showing distribution of *Poirieria zelandica* (Quoy & Gaimard, 1833). 200 and 1000 meter contours indicated.

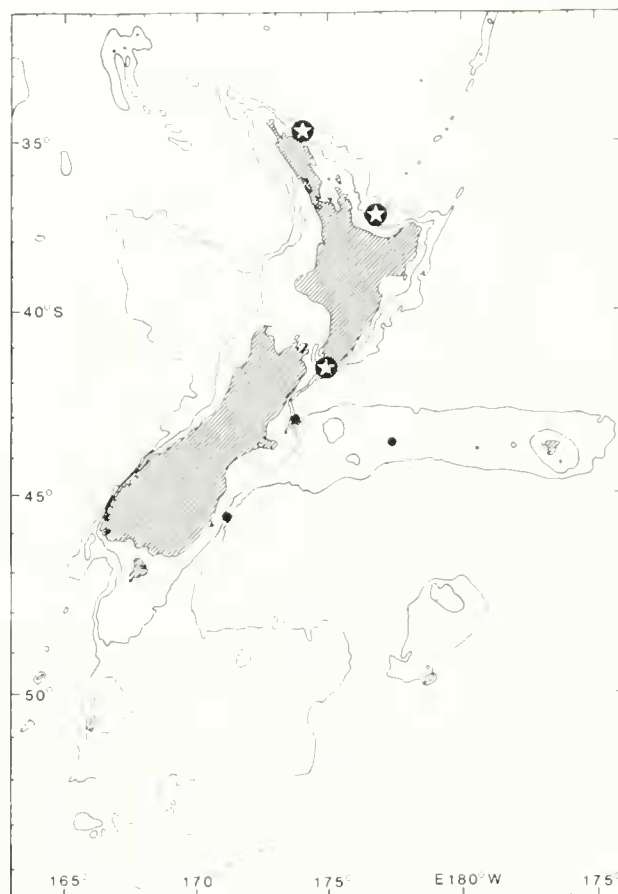
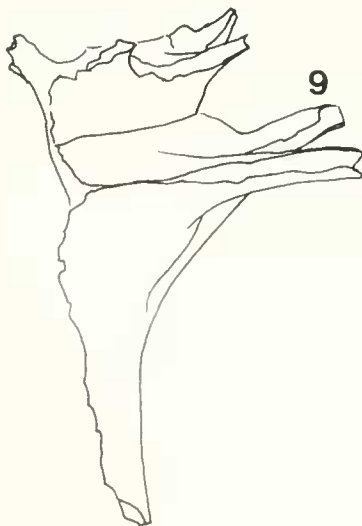
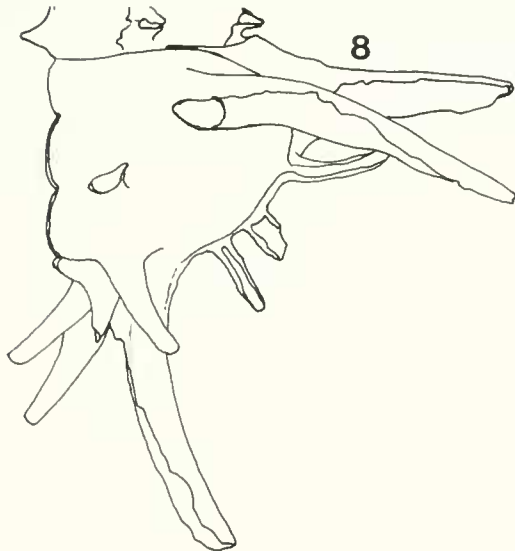
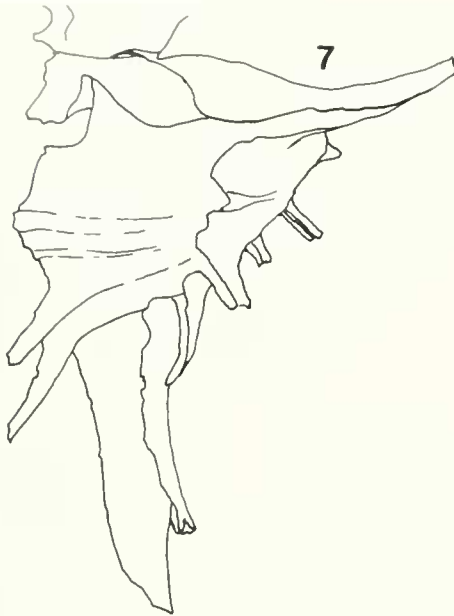


Figure 6. Map of New Zealand showing distribution of *Poirieria syrinx* new species (stars) and *Poirieria kopua* Dell, 1956 (solid circles). 200 and 1000 meter contours indicated.

Beach, but these had probably been transported inshore by storms. There is considerable variation in the length of the spines (figures 10–14), which tend to be longest in specimens from muddy substrata, and shortest in specimens from coarser substrata. Grading southward through intermediate forms, specimens from off the southern South Island and Stewart Island (figure 11) attain about half the size of the largest northern specimens, and are more stoutly built, often with a few low rounded denticles within the outer lip. In their stout build the Recent southern form approaches Late Pliocene (Mangapanian) and Early Pleistocene (Nukumaruan) forms of *P. zelandica* (figure 15), though the fossils are consistently thicker, have more strongly dentate outer lips, and attain the size of Recent northern specimens. It should be appreciated that all of the fossils are from the southern half of the North Island, and since shells of equivalent age are unknown from further north (due to lack of exposures), it is unknown whether northern Late Pliocene–Early Pleistocene shells were more lightly built. Maxwell (1971) concluded that *P. zelandica* evolved gradually from *P. primigena* Finlay, 1930, a species in which the shoulder is set lower on the whorls and that ranges from

Late Oligocene (Duntroonian to Early Pliocene (Opotian)).

Watson's (1886:157) records of *P. zelandica* from CHALLENGER stations 171 (north of Raoul Island, Kermadec Islands, 1097 m) and 172 (off Tongatabu, 18 m.) are highly anomalous since, apart from the Challenger Plateau record, the species has never been obtained from beyond the New Zealand continental shelf. These specimens (BMNH 1887.2.9.546–7, 1887.2.9.548) are perfectly accordant with the specimens from CHALLENGER station 167A (Queen Charlotte Sound, New Zealand, 18 n, BMNH 1887.2.9.544–5) and numerous additional specimens from the vicinity (MNZ). Although it seems clear that the specimens from stations 171 and 172 were introduced through entanglement in the nets or ropes, it is significant that they were not detected at stations 168–170, presumably through oversight or the use of a different trawl. According to the Narrative of the Cruise (Tizard *et al.*, 1885) and the Summary of Results (Murray, 1895), stations 168–171 were sampled by trawl and station 172 by dredge. According to Tizard *et al.* (1885: 1012) station 167A was by dredge alone, but in fact there were also two trawlings at this station (Murray, 1895:



593), which would account for the presence of contaminants in both dredge and trawl stations.

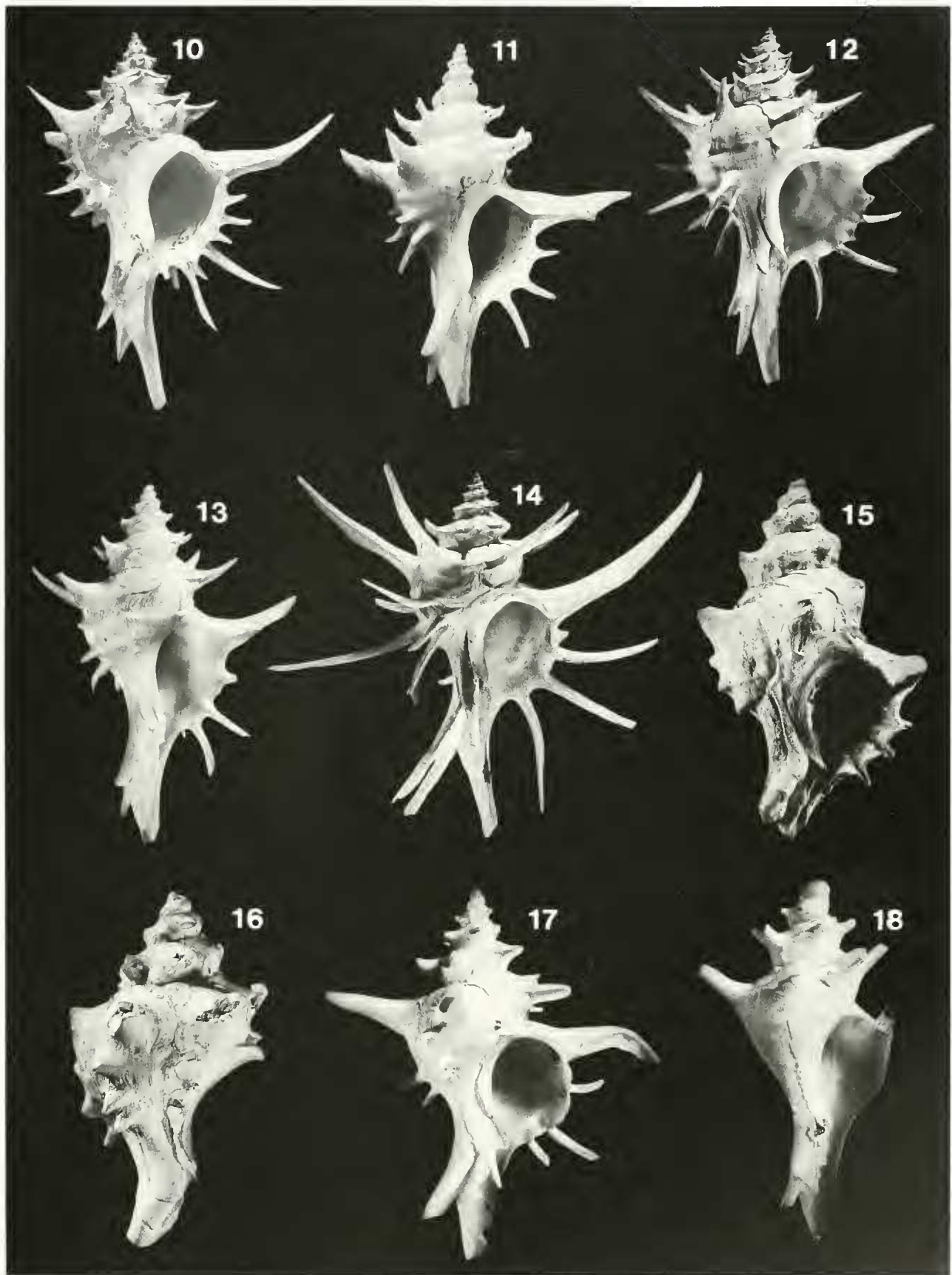
Poirieria syrinx Marshall and Houart, new species (figures 2, 6, 8, 16, 17)

Poirieria zelandica - Dell, 1962:76 (not Quoy & Gaimard, 1833).
Poirieria kopua - Dell, 1963:212 (not Dell, 1956); Powell, 1979: 170 (text in part).

Description: Shell of medium size for the genus, length up to 45 mm, broadly fusiform, spire slightly higher than aperture, suture well impressed, glossy, white or salmon pink. Protoconch 1.20 mm wide, taller than broad, of $1\frac{1}{4}$ - $1\frac{3}{4}$ convex whorls, smooth, glossy, terminal varix prominent. Teleoconch of up to $5\frac{3}{4}$ convex whorls, suture well impressed. Varices thin, sharp-edged, prominently spinose, numbering 5 on 1st whorl, 5 on 2nd, 5 or 6 on 3rd, 5 or 6 on 4th, and 4 or 5 on 5th whorl. Spines slender, sharp, gently curved, bases set behind varical rim, shoulder spine strongly posterior; leading edge open to varical rim at first, becoming closed after 3rd whorl so that proximal part of each spine is fully tubular. Shoulder spine row the most prominent, situated medially on earliest whorls, then supramedi ally. Secondary spines abapical, 3, relative sizes variable, about equidistant, commencing after 3rd whorl, bases centered well in front of that of shoulder spine, adapical spine row exposed on spire, set about midway between shoulder spine row and suture or abapically, abapical spines of previous whorl in front of aperture. Aperture roundly ovate. Inner lip thin, smooth, fully contacting or free over abapical half.

Figures 7-9. Outer lip profiles of New Zealand *Poirieria* species. 7. *Poirieria zelandica* (Quoy & Gaimard, 1833), Orchard Bay, Marlborough Sounds, 29 m, MNZ M.45110, shell height 28.0 mm. 8. *Poirieria syrinx* new species, holotype, MNZ M.117782, shell height 26.0 mm. 9. *Poirieria kopua* Dell, 1956, paratype, Chatham Rise, 530 m, MNZ M.10506, shell height 14.7 mm. Scale bars = 4.0 mm.

Figures 10-18. Shells of New Zealand *Poirieria* species. 10-15. *Poirieria zelandica* (Quoy & Gaimard, 1833). 10. Holotype, MNHN, shell height 52.0 mm. 11. Port Pegasus, Stewart Island, 40-46 m, MNZ M.26617, shell height 32.7 mm. 12. Off Poor Knights Islands, MNZ M.83858, shell height 54.0 mm. 13. Orchard Bay, Marlborough Sounds, 29 m, MNZ M.45110, shell height 28.0 mm. 14. Off Waiheke Island, 40 m, MNZ M.35635, shell height 57.5 mm. 15. Cliffs west of Whangaimoana, Palliser Bay, Early Pleistocene (Nukumaruan), MNZ M.40361, shell height 32.8 mm. 16, 17. *Poirieria syrinx* new species. 16. Cliffs west of Whangaimoana, Palliser Bay, Early Pleistocene (Nukumaruan), MNZ M.91795, shell height 25.8 mm (incomplete). 17. Holotype, MNZ M.117782, shell height 26.0 mm. 18. *Poirieria kopua* Dell, 1956, paratype, Chatham Rise, 530 m, MNZ M.10506, shell height 14.7 mm.



Outer lip thin at rim, internally slightly thickened, smooth, simple. Siphonal canal long, semitubular, spineless, gently curved, 2 or 3 previous canals retained. Outer shell layer (intritax) hard, dense, weakly or locally obscurely spirally lirate, translucent, glossy, becoming chalky through erosion.

Animal with small subparallel cephalic tentacles, eyes on outer edges at about midlength, subcylindrical behind them, tapered before. Male unknown. Radula (figure 2) similar to that of *Poirieria zelandica*.

Type material: Holotype (M.117782,) and 2 paratypes MNZ: BS761 (R119), 37°22.0'S, 176°40'E, 37 km E of Mayor I., New Zealand, alive, 616–666 m, January 24, 1979, R.V. TANGAROA (type locality). Other paratypes (10): I364, 34°46'S, 174°05.8'E, NE of Cavalli I. alive, 492 m, November 20, 1977, R.V. TANGAROA (1 NZOI); 24 km NE of Plate I., alive, 622–585 m, October 29, 1962, M.V. IKATERE (1 MNZ); BS741 (R99), 37°20.6'S, 176°28.0'E, 17 km E of Mayor I., alive, 482–550 m, January 22, 1979, R.V. TANGAROA (3 MNZ); 37°31.64'S, 176°55.35'E, SW of White I., alive, 500–518 m, January 20, 1993, F.V. KAHAROA (1 MNZ); VUZ97, 41°33'S, 174°57'E, off Palliser Bay, alive, 786 m, August 28, 1957; (3 MNZ, 1 R. Houart collection).

Other material examined: Cliffs west of Whangaimoana, Palliser Bay, New Zealand, 1971–73, B.A. Marshall, Early Pleistocene (Nukumaruan) (1 specimen).

Distribution: (figure 6): Early Pleistocene (Nukumaruan) of Palliser Bay, and Recent off northeastern North Island and Cook Strait, New Zealand, living at 482–786 m on mud.

Remarks: Compared with *Poirieria zelandica*, which it most resembles in shell morphology, *P. syrinx* n. sp. differs in having the bases of the spines set further behind each varical rim, and in that the proximal parts of each spine become fully tubular after the third teleoconch whorl. Other shell differences include the smaller size (maximum length 45 mm vs. 71.5 mm), the larger protoconch (width 1.2 mm vs. of 0.9–1.0 mm), the more prominent spiral microlirae, and the absence or extreme weakness of spiral swellings between the bases of the spines. The animal (preserved material) differs markedly from that of *P. zelandica* in having considerably shorter cephalic tentacles that are almost parallel instead of strongly divergent, with eyes situated closer to the head. Unfortunately the male of *P. syrinx* n. sp. was not available for comparison of the penial morphology. Their radulae are similar (figures 1, 2). *Poirieria syrinx* n. sp. and *P. zelandica* have overlapping geographic and bathymetric ranges, and the two species have been obtained living together (37°20.6'S, 176°28.0'E, off Mayor Island, 482–550 m, MNZ M.60247, 95064).

Poirieria kopua differs from *P. syrinx* n. sp. in attaining a smaller size (to 19.0 mm high), in having a larger protoconch (width 1.5–1.7 mm), in having a fully open shoulder spine on each varix, and in lacking secondary spines. Judging from their protoconchs, both species have

non-planktotrophic larval development (probably direct). They appear to be allopatric, though they could conceivably occur together off Cape Campbell. None of the New Zealand Tertiary species have tubular spine bases (Maxwell, 1971). The Early Pleistocene (Nukumaruan) specimen (figure 16) is indistinguishable from Recent shells. Beu's (1967) conclusion that the Whangaimoana beds were deposited at 400–600 meters depth is accordant with the known bathymetric range of this species.

Etymology: Greek *syrinx* (pipe).

Poirieria kopua Dell, 1956
(figures 3, 6, 9, 18)

Poirieria kopua Dell, 1956:114, pl. 16, figs. 161, 162, 165; Maxwell, 1971:771, figs. 26, 27; Powell, 1979:170 (in part), fig. 42/1.

NOT *Poirieria kopua* Dell, 1962:76; Dell, 1963:212 (= *P. syrinx* n. sp.).

Type material: Holotype MNZ M.9777 and 2 paratypes (MNZ and Canterbury Museum, Christchurch): C.I.E. sta. 59, 43°38'S, 177°19'E, Chatham Rise, alive, 530 m, February 11, 1954, M.V. ALERT.

Other material examined: (11 specimens) BS559, 43°14'S, 173°39'E, wall of Pegasus Canyon, off Kaikoura, New Zealand, dead, 1006–512 m, September 27, 1976, R.V. ACHERON (2 MNZ); BS201, 44°45.6'S, 171°05'E, off Taiaroa Head, dead, c. 549 m, January 23, 1957, M.V. ALERT (3 MNZ); BS582, 45°46'S, 171°03'E, off Taiaroa Head, dead, 660 m, September 1, 1976, R.V. MUNIDA (5 MNZ); Mu 70–45, 45°50'S, 171°01'E, off Taiaroa Head, dead, 540–490 m, October 22, 1970, R.V. MUNIDA (1 NZGS).

Distribution: (figure 6) Chatham Rise and off the east coast of South Island, from Kaikoura to Taiaroa Head, New Zealand, 490–1006 m, taken alive at 530 m.

Remarks: The shell of *P. kopua* differs from that of *P. zelandica* and *P. syrinx* n. sp. in attaining smaller shell size (to 19.0 mm), in having a larger protoconch (width 1.50–1.70 mm), in lacking secondary spines below the peripheral spines, and in that the spines are not fully tubular at their bases. The radula is similar in all three Recent species of *Poirieria* (figures 1–3).

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